

COMPACT SYSTEM MODULE WITH BUILT-IN THERMOELECTRIC COOLING

5 This application is a divisional of U.S. Application No. 09/144307
 NOW U.S. PATENT 6,586,835
 filed on August 31, 1998 which is incorporated herein by reference.

Field of the Invention

The present invention relates generally to semiconductor integrated circuits.
10 More particularly, it pertains to a compact system module with built-in
 thermoelectric cooling.

Background of the Invention

Integrated circuit technology relies on transistors to formulate vast arrays of
15 functional circuits. The complexity of these circuits requires the use of an ever
 increasing number of linked transistors. As the number of transistors required
 increases, the integrated circuitry dimensions shrink. It is one objective in the
 semiconductor industry to construct transistors and other discrete devices which
 occupy less surface area on a given silicon chip/die. At the same time, the
20 semiconductor industry seeks to increase the speed and power offered by integrated
 circuits. One approach to the latter challenge is through the development of
 improved methods for electrically connecting and packaging circuit devices which
 are fabricated on the same or on different silicon chips.

Ideally, we would like to build a computing system by fabricating all the
25 necessary integrated circuits on one wafer or chip, as compared with today's method
 of fabricating many chips of different functions and packaging them to assemble a
 system. A true "system on a chip" would greatly improve integrated circuit
 performance and provide higher bandwidth. Unfortunately, it is very difficult with